

PATENT ABSTRACTS OF JAPAN

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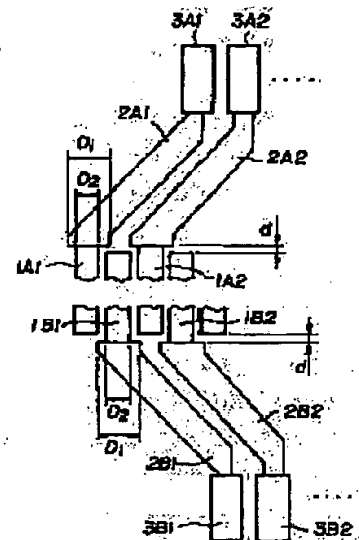
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(54) LIQUID CRYSTAL DISPLAY ELEMENT

(57)Abstract:

PROBLEM TO BE SOLVED: To make a display of high picture quality having no display unevenness by reducing a light leak from an electrode pattern of a wiring part.

SOLUTION: This element has illumination part electrodes 1A1, 1A2... formed in a display part area on the surface of at least one of a couple of substrates, arranged opposite each other across liquid crystal, which abuts against the liquid crystal, upper terminal part electrodes 3A1, 3A2... and lower terminal part electrodes 3B1, 3B2... at one edge and the other edge of the former substrate, and wiring part electrodes 2A1, 2A2... and 2B1, 2B2... which connect the illumination part electrodes to the upper and lower terminal electrodes alternately; and end parts of the illumination part electrodes 1A1, 1A2... and 1B1, 1B2... are arranged in upper and lower stages alternately and the electrode width of the wiring part electrodes 2A1, 2A2... and 2B1, 2B2... is made wider than the electrode width of the illumination part electrodes.



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CLAIMS

[Claim(s)]

[Claim 1] Two or more lighting section electrodes formed in the display field of the field which contacts said liquid crystal of one [at least] substrate of the substrate of the pair by which intervenes liquid crystal and opposite arrangement is carried out mutually, and the substrate of said pair, In the liquid crystal display component which has two or more top terminal area electrodes and bottom terminal area electrodes which were prepared in one [said] end edge and other end edge of a substrate, and two or more wiring section electrodes which connect said lighting section electrode to said top terminal area electrode and a bottom terminal electrode by turns The liquid crystal display component characterized by making electrode width of face of said wiring section electrode larger than the electrode width of face of the lighting section electrode concerned while arranging the edge of said lighting section electrode to an upper lower-berth difference every other.

[Claim 2] The liquid crystal display component according to claim 1 characterized by making mutual spacing [/ near / said / the lighting section electrode] of said wiring section electrode into spacing of said lighting section electrode, and a **** EQC at least.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the liquid crystal display component which reduces the effect of the optical leakage resulting from the difference in the arrangement consistency of the wiring section electrode group which combines the lighting section electrode group of a large number which started the liquid crystal display component, especially were formed in the viewing area, and the terminal area electrode group pulled out around the substrate, and obtained the image display of high quality.

[0002]

[Description of the Prior Art] Recently, what used the liquid crystal display component (LCD) for the display device as a monitor of picture reproducer or various information terminals is used abundantly.

[0003] As a liquid crystal display component, the passive-matrix mold known as a STN mold and the active-matrix mold using non-line type components, such as TFT, are common.

[0004] Hereafter, a STN mold liquid crystal display component (STN-LCD) is explained as an example.

[0005] What is called Twisted Nematic (TN) type of the conventional liquid crystal display component was a rectangular cross or a thing arranged so that it may become parallel to the liquid crystal molecule by the nematic liquid crystal which has a forward dielectric constant anisotropy between two electrode substrates in which the transparent electrode which consists of ITO was formed with which it has distorted spiral structure 90 degrees,

and the polarization shaft (or absorption shaft) adjoins an electrode substrate in a polarizing plate on the outside of a two-electrodes substrate (JP,51-13666,B).

[0006] With the liquid crystal display component such whose a twist angle (α) is 90 degrees, there was a problem in respect of the steepness (γ) of change of the permeability of the electrical-potential-difference pair liquid crystal layer impressed to a liquid crystal layer, and a viewing-angle property, and, as for the number of time sharing (equivalent to the number of scan electrodes), 64 was a practical limitation. However, in order to cope with the image quality improvement and display amount-of-information increase demand to a liquid crystal display component in recent years, The twist angle α of a liquid crystal molecule from 180 degrees in size And by using the birefringence effectiveness A time-sharing drive property is improved. The number of time sharing making it increase — applied one FIJIKUSU The letter 45, No.10, 1021 1984 () [Applied Physics Letter, T.J.Scheffer, J.Nehring: "A new,] [highly multiplexable liquidcrystal] display" It is discussed and is the sault parts ISUTEDDO birefringence effectiveness mold (SBE). The liquid crystal display is proposed.

[0007] The electrode substrate of the pair by which intervenes a liquid crystal layer (only henceforth liquid crystal), and opposite arrangement is mutually carried out in this kind of liquid crystal display component (only henceforth a substrate), To the viewing area of the field which contacts one [at least] above-mentioned liquid crystal of the substrate of a top Norikazu pair, many lighting section electrode groups, It is combined with the terminal area electrode group which has been arranged rather than the arrangement consistency of the above-mentioned display electrode group from that viewing area for two or more blocks of every in this lighting section electrode group at high density, and was pulled out through the wiring section electrode group around the above-mentioned substrate. Each block of a terminal area electrode group is connected to the tape career package which carried the drive IC called TCP through an anisotropy conductor etc.

[0008] The wiring section electrode group of each block is formed toward the above-mentioned terminal area electrode side by the pattern (it is a sector if it goes to a lighting section electrode side from a terminal area electrode side) of a reverse sector from a lighting section electrode side.

[0009] Drawing 4 is a mimetic diagram explaining the example of arrangement of a lighting section electrode, a wiring section electrode, and a terminal area electrode, in 1A and 1B, a lighting section electrode, 2A, and 2B show 3A, and a wiring section electrode and 3B show a terminal area electrode.

[0010] The lighting section electrodes 1A and 1B are connected to each TCP 4A and 4B through top terminal area electrode 3A and bottom terminal area electrode 3B by bottom wiring section electrode 2A and bottom wiring section electrode 2B every other.

[0011] In addition, the scan section electrode (not shown) formed in the substrate of another side separate from the substrate which formed this lighting section electrode in the field of the lighting section electrodes 1A and 1B is intersected.

[0012] And 1 pixel consists of intersections of the lighting section electrodes 1A and 1B and a scan section electrode.

[0013]

[Problem(s) to be Solved by the Invention] Drawing 5 is a mimetic diagram explaining the example of a configuration of the wiring section electrode which connects the lighting section electrode and terminal area electrode in the conventional technique, and the same sign as drawing 4 corresponds to the same part.

[0014] As illustrated, it connected with the top terminal area electrode three A1 with the bottom wiring electrode two A1, and the lighting section electrode one A1 has connected the adjoining lighting section electrode one B1 to the bottom terminal area electrode three B1 by bottom wiring electrode 2B1. And in order to have to form these wiring section electrodes two A1 and 2B1 by the pattern of a reverse sector, the line breadth of the circuit pattern is formed narrowly.

[0015] Since this wiring section electrode is located in a display side from a match-plate location, the shade produced into this part will be conspicuous.

[0016] TCP of said drive LSI loading connected to a terminal area electrode takes charge of the per [80] piece - 100 terminal as 1 block, and the terminal pitch is about 0.2mm smaller than a display block electrode group.

[0017] Therefore, when width of face of a wiring section electrode is made the same, it is arranged by secret ** toward a lighting section electrode like the bone of a fan from a terminal area section electrode.

[0018] Since it is such a circuit pattern, a big clearance is made to each wiring section inter-electrode, and the light from a back light penetrates this part, consequently the so-called optical poor leakage occurs.

[0019] Usually, as the thickness (ITO thickness) of the electrode is 0.1-0.2 micrometers (in the case of the low resistance ITO used for STN-LCD) before and behind 90% and the permeability of a glass substrate with an

electrode was described above, permeability and the big difference to Δn arise by the existence of an electrode.

[0020] Therefore, in NEGAMODO whose roughness and fineness of the above-mentioned electrode are especially the mainstream of STN-LCD, there was a problem of becoming the shade (it being the shade of a hue in the case of a color) of brightness on a display periphery, and degrading display quality.

[0021] In addition, the same problem arises also in active-matrix LCD, such as not only the above-mentioned STN-LCD but a TFT mold.

[0022] The purpose of this invention is to offer the liquid crystal display component which enabled the high-definition display which solves the problem of the above-mentioned conventional technique, reduces the optical leakage from a wiring section electrode pattern, and does not have display unevenness.

[0023]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, this invention shifts the edge of a wiring section electrode group in a completely different class up and down every other, and reduces the clearance between wiring section inter-electrode by enlarging wiring width of face using this shifted tooth space.

[0024] Namely, the substrate of the pair by which this invention intervenes liquid crystal and opposite arrangement is carried out mutually, Two or more lighting section electrodes formed in the display field of the field which contacts said liquid crystal of one [at least] substrate of the substrate of said pair, In the liquid crystal display component which has two or more top terminal area electrodes and bottom terminal area electrodes which were prepared in one [said] end edge and other end edge of a substrate, and two or more wiring section electrodes which connect said lighting section electrode to said top terminal area electrode and a bottom terminal electrode by turns While arranging the edge of said lighting section electrode to an upper lower-berth difference every other, it is characterized by making electrode width of face of said wiring section electrode larger than the electrode width of face of the lighting section electrode concerned.

[0025] Moreover, it is characterized by making mutual spacing [/ near / said / the lighting section electrode] of said wiring section electrode into spacing of said lighting section electrode, and a **** EQC at least.

[0026] By having considered as such a circuit pattern, while optical leakage is prevented, the resistance of a wiring section electrode can be lowered and the image display of high quality can be obtained.

[0027]

[Embodiment of the Invention] Hereafter, with reference to an example, it explains to a detail about the gestalt of operation of this invention.

[0028] Drawing 1 is a mimetic diagram near [for explaining one example of the liquid crystal display component by this invention] the wiring section, and the same sign as said drawing 4 corresponds to the same part.

[0029] In this example, each wiring section electrode side (upper limit and lower limit) of the lighting section electrodes 1A and 1B is arranged to an upper lower-berth difference every other. That is, while only distance d makes the upper limit of the lighting section electrode one A1 project from the upper limit of the adjoining lighting section electrode one B1, from the lower limit of the lighting section electrode one A1, only distance d is made to project and the lower limit of the lighting section electrode one B1 is formed.

[0030] And it considers as the configuration where the wiring section electrode two A1 formed in the upper limit of the lighting section electrode one A1 was illustrated, and is the edge width of face D1. As it ***** above the edge of the adjoining lighting section electrode one B1 in a completely different class, it is the width of face D2 of the lighting section electrode one B1 concerned. It forms widely.

[0031] Edge width of face D1 of wiring section electrode 2B1 which similarly is formed in the lower limit of the lighting section electrode one B1 contiguous to the lighting section electrode one A1 As it ***** above the edge of the adjoining lighting section electrode one A1 in a completely different class, it is the width of face D2 of the lighting section electrode one B1 concerned. It forms widely.

[0032] Thus, by arranging mutually the above-mentioned lighting section electrode one A1, the terminal area electrode three A1 of 1A2 ..., three A2, .. and the lighting section electrode one B1, 1 B-2, wiring section electrode 2B1 of ..., 2B2, and .. in a completely different class, the width of face of a wiring section electrode can be expanded, and adjoining wiring section inter-electrode spacing can be narrowed.

[0033] While the optical leakage from a wiring section electrode pattern is reduced, the resistance of a wiring section electrode is equalized by the configuration of this example, and the display of high definition without display unevenness is attained by it.

[0034] Drawing 2 is a mimetic diagram near [for explaining other examples of the liquid crystal display component by this invention] the wiring section, and the same sign as said drawing 1 corresponds to the same part.

[0035] The configurations of a wiring section electrode differ, and also this example is the same as that of said example. That is, the wiring section two A1 of this example, two A2, .. and 2B1, 2B2, and .. are width of face D1 at a part for the lighting section electrode one A1, one A2, ... and one B1, 1 B-2, and an articulated section with ... It carries out and is formed in the configuration which width of face reduces gradually towards the terminal area electrode three A1, three A2, ... and three B1, 3 B-2, and ... from this part.

[0036] The configuration of the wiring section electrode in this invention is easy to extend with a reverse sector in a thing as showed the configuration for an articulated section with a lighting section electrode to each above-mentioned example, or a proper configuration in the direction of a terminal area electrode.

[0037] Drawing 3 is a cross section near [for explaining the example of the liquid crystal display component by this invention] the wiring section, and, as for the lighting section electrode of another side where one substrate and 20 were formed in the substrate of another side, and 10 formed 21 in the substrate of another side, and 30, liquid crystal and 40 are sealing compounds.

[0038] A liquid crystal display component forms the lighting section electrode groups 1 and 21 in each inside of the substrate of a pair which consists of a glass substrate etc., sticks both substrates, pours liquid crystal 30 into the gap, and comes to close it by the sealing compound 8.

[0039] The lighting section electrode 1 is extended and formed in terminal area field 3A through lighting field 1A to wiring section field 2A. And it is formed in the wiring section electrode two A1 which constitutes the above-mentioned wiring section field 2A, two A2, and 2B1, 2B2, each (refer to drawing 1 and drawing 2) and lighting section electrode one A1, one A2, ... and one B1, 1 B-2, the configuration where the edge for an articulated section of ... was explained above, and electrode width of face.

[0040] In addition, while the optical leakage in the boundary of the lighting section and the wiring section is equated and there is the further reduction effectiveness of display nonuniformity by making mutual spacing [/ near the lighting section electrode] of a wiring section electrode into spacing of a lighting section electrode, and a **** EQC at least, the so-called equalization of delta-n-d in this field can also be attained.

[0041] As explained to each above-mentioned example, the liquid crystal display which applied this invention can reduce the shade of the brightness in the viewing area, and can obtain the liquid crystal display component of high display quality.

[0042] It cannot be overemphasized that it is what does not restrict this invention to the above-mentioned STN mold liquid crystal display component, and can be applied also to active matrix liquid crystal display devices, such as the so-called TFT mold.

[0043]

[Effect of the Invention] As explained above, while the optical leakage of a back light is reduced by making large width of face of each wiring electrode of the wiring section electrode group which intervenes between a display electrode group and a terminal area electrode group according to this invention, wiring resistance is equalized and the liquid crystal display component of high quality can be offered.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a mimetic diagram near [for explaining one example of the liquid crystal display component by this invention] the wiring section.

[Drawing 2] It is a mimetic diagram near [for explaining one example of the liquid crystal display component by

this invention] the wiring section.

[Drawing 3] It is a cross section near [for explaining the example of the liquid crystal display component by this invention] the wiring section.

[Drawing 4] It is a mimetic diagram explaining the example of arrangement of a lighting section electrode, a wiring section electrode, and a terminal area electrode.

[Drawing 5] It is a mimetic diagram explaining the example of a configuration of the wiring section electrode which connects the lighting section electrode and terminal area electrode in the conventional technique.

[Description of Notations]

one A1 and one A2 .., one B1, and 1 B-2 .. Lighting section electrode

two A1 and two A2 .., 2B1, and 2B2 .. Wiring section electrode

three A1 and three A2 .., three B1, and 3 B-2 .. Terminal area electrode

10 20 Substrate

30 Liquid Crystal

40 Sealing compound.

[Translation done.]

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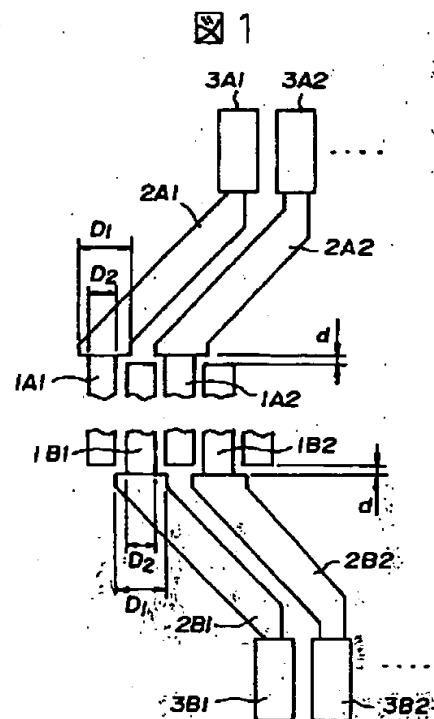
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(54) 【発明の名称】 液晶表示素子

(57) 【要約】

【課題】 配線部電極パターンからの光漏れを低減して表示むらのない高画質の表示を可能とする。

【解決手段】 液晶を介して互いに対向配置される一対の基板の少なくとも一方の基板の液晶と当接する面の表示部領域に形成された複数の点灯部電極 1 A 1, 1 A 2, ..., 1 B 1, 1 B 2, ... と、一方の基板の一端縁と他端縁に設けられた複数の上側端子部電極 3 A 1, 3 A 2, ... および下側端子部電極 3 B 1, 3 B 2, ... と、点灯部電極を上側端子部電極と下側端子部電極に交互に接続する複数の配線部電極 2 A 1, 2 A 2, ..., 2 B 1, 2 B 2, ... とを有し、点灯部電極 1 A 1, 1 A 2, ..., 1 B 1, 1 B 2, ... の端部を一本置きに上下段違いに配置すると共に、配線部電極 2 A 1, 2 A 2, ..., 2 B 1, 2 B 2, ... の電極幅を当該点灯部電極の電極幅より広くした。



(2)

【特許請求の範囲】

【請求項1】液晶を介在して互いに対向配置される一対の基板と、前記一対の基板の少なくとも一方の基板の前記液晶と当接する面の表示部領域に形成された複数の点灯部電極と、前記一方の基板の一端縁と他端縁に設けられた複数の上側端子部電極および下側端子部電極と、前記点灯部電極を前記上側端子部電極と下側端子部電極に交互に接続する複数の配線部電極とを有する液晶表示素子において、

前記点灯部電極の端部を一本置きに上下段違いに配置すると共に、前記配線部電極の電極幅を当該点灯部電極の電極幅より広くしたことを特徴とする液晶表示素子。

【請求項2】前記配線部電極の少なくとも前記点灯部電極近傍における相互の間隔を前記点灯部電極の間隔と略々同等としたことを特徴とする請求項1に記載の液晶表示素子。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は液晶表示素子に係り、特に表示領域に形成された多数の点灯部電極群と、基板の周辺に引き出された端子部電極群とを結合する配線部電極群の配置密度の違いに起因する光漏れの影響を低減して高品質の画像表示を得るようにした液晶表示素子に関する。

【0002】

【従来の技術】最近、画像再生装置や各種情報端末機のモニターとしての表示デバイスに、液晶表示素子(LCD)を用いたものが多用されている。

【0003】液晶表示素子としては、STN型として知られる単純マトリクス型と、TFT等の非線型素子を用いたアクティブ・マトリクス型とが一般的である。

【0004】以下、STN型液晶表示素子(STN-LCD)を例として説明する。

【0005】従来の液晶表示素子のツイステッドネマチック(TN)タイプと言われるものは、ITOからなる透明電極を形成した2枚の電極基板間に正の誘電率異方性を有するネマチック液晶による90度ねじれた螺旋構造を有し、かつ両電極基板の外側には偏光板をその偏光軸(あるいは吸収軸)が電極基板に隣接する液晶分子に対し直交あるいは平行になるように配置するものであった(特公昭51-13666号公報)。

【0006】このようなねじれ角(α)が90度の液晶表示素子では、液晶層に印加される電圧対液晶層の透過率の変化の急峻性(γ)、視角特性の点で問題があり、時分割数(走査電極の数に相当)は64が実用的限界であった。しかし、近年の液晶表示素子に対する画質改善と表示情報量増大要求に対処するため、液晶分子のねじれ角 α を180度より大に、かつ複屈折効果を利用することにより時分割駆動特性を改善して時分割数を増大させることがアプライド・フィジクス・レター45, No. 1

0, 1021 1984(Applied Physics Letter, T. J. Scheffer, J. Nehring: "A new, highly multiplexable liquid crystal display")に論じられ、スーパーツイステッド複屈折効果型(SBE)液晶表示装置が提案されている。

【0007】この種の液晶表示素子においては、液晶層(以下、単に液晶という)を介在して互いに対向配置される一対の電極基板(以下、単に基板という)と、上記一対の基板の少なくとも一方の上記液晶と当接する面の表示領域に多数の点灯部電極群と、この点灯部電極群を複数のブロック毎にその表示領域から上記表示部電極群の配置密度よりも高密度に配置されて上記基板の周辺に配線部電極群を介して引き出された端子部電極群と結合される。端子部電極群の各ブロックはTCPと称する駆動ICを搭載したテープキャリアパッケージに異方性導電体等を介して接続される。

【0008】各ブロックの配線部電極群は点灯部電極側から上記端子部電極側に向かって逆扇形のパターン(端子部電極側から点灯部電極側に向かっては扇形)で形成される。

【0009】図4は点灯部電極と配線部電極および端子部電極の配置例を説明する模式図であって、1A, 1Bは点灯部電極、2A, 2Bは配線部電極、3A, 3Bは端子部電極を示す。

【0010】点灯部電極1A, 1Bは一本置きに上側配線部電極2Aと下側配線部電極2Bで上側端子部電極3Aと下側端子部電極3Bを介して、それぞれのTCP4Aと4Bに接続される。

【0011】なお、点灯部電極1A, 1Bの領域においてこの点灯部電極を形成した基板とは別個の他方の基板に形成された走査部電極(図示せず)に交差している。

【0012】そして、点灯部電極1A, 1Bと走査部電極の交点で一画素が構成される。

【0013】

【発明が解決しようとする課題】図5は従来技術における点灯部電極と端子部電極を接続する配線部電極の構成例を説明する模式図であって、図4と同一符号は同一部分に対応する。

【0014】図示したように、点灯部電極1A1は上側配線電極2A1で上側端子部電極3A1に接続し、隣接する点灯部電極1B1は下側配線電極2B1で下側端子部電極3B1に接続している。そして、これらの配線部電極2A1, 2B1は逆扇形のパターンで形成しなければならないため、その配線パターンの線幅が狭く形成されている。

【0015】この配線部電極は見切り板位置より表示部側に位置するため、この部分に生じる濃淡が目立つことになる。

【0016】端子部電極に接続される前記駆動LSI搭載のTCPは、その1個当たり80~100端子を1ブロックとして担当し、その端子ピッチは表示ブロック電

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極群より小さい0.2mm程度である。

【0017】したがって、配線部電極の幅を同一とした場合は、端子部電極から扇の骨のように点灯部電極に向かって密から粗に配列される。

【0018】このような配線パターンであるために、各配線部電極間に大きな隙間ができ、バックライトからの光がこの部分を透過し、その結果、所謂光漏れ不良が発生する。

【0019】通常、電極付きガラス基板の透過率は90%前後で、その電極の膜厚(I TO膜厚)は0.1~0.2 μ m(STN-LCDに使用される低抵抗ITOの場合)であり、上記したように電極の有無によって透過率および $\Delta n \cdot d$ に大きな差が生じる。

【0020】したがって、上記電極の粗密が、特にSTN-LCDの主流であるネガモードでは、表示部外周で明るさの濃淡(カラーの場合は色相の濃淡)となって表示品質を劣化させてしまうという問題があった。

【0021】なお、上記のSTN-LCDに限らず、TFT型等のアクティブマトリクス方式LCDにおいても同様の問題が生じる。

【0022】本発明の目的は、上記従来技術の問題を解消し、配線部電極パターンからの光漏れを低減して表示むらのない高画質の表示を可能とした液晶表示素子を提供することにある。

【0023】

【課題を解決するための手段】上記目的を達成するために、本発明は、配線部電極群の端部を一本置きに上下に段違いにずらし、このずらしたスペースを利用して配線幅を大きくすることによって配線部電極間の隙間を低減したものである。

【0024】すなわち、本発明は、液晶を介在して互いに対向配置される一対の基板と、前記一対の基板の少なくとも一方の基板の前記液晶と当接する面の表示部領域に形成された複数の点灯部電極と、前記一方の基板の一端縁と他端縁に設けられた複数の上側端子部電極および下側端子部電極と、前記点灯部電極を前記上側端子部電極と下側端子部電極に交互に接続する複数の配線部電極とを有する液晶表示素子において、前記点灯部電極の端部を一本置きに上下段違いに配置すると共に、前記配線部電極の電極幅を当該点灯部電極の電極幅より広くしたことを特徴とする。

【0025】また、前記配線部電極の少なくとも前記点灯部電極近傍における相互の間隔を前記点灯部電極の間隔と略々同等としたことを特徴とする。

【0026】このような配線パターンとしたことで、光漏れが防止されると共に、配線部電極の抵抗値を下げることができ、高品質の画像表示を得ることができる。

【0027】

【発明の実施の形態】以下、本発明の実施の形態につき、実施例を参照して詳細に説明する。

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【0028】図1は本発明による液晶表示素子の一実施例を説明するための配線部近傍の模式図であって、前記図4と同一符号は同一部分に対応する。

【0029】本実施例では、点灯部電極1A、1Bの各配線部電極側(上端および下端)を一本置きに上下段違いに配置する。すなわち、点灯部電極1A1の上端を隣接する点灯部電極1B1の上端より距離dだけ突出させると共に、点灯部電極1B1の下端を点灯部電極1A1の下端より距離dだけ突出させて形成する。

【0030】そして、点灯部電極1A1の上端に形成する配線部電極2A1を図示した形状とし、その端部幅D1を隣接する点灯部電極1B1の段違い端部の上方に張り出すようにして当該点灯部電極1B1の幅D2より広く形成する。

【0031】同様に、点灯部電極1A1に隣接する点灯部電極1B1の下端に形成する配線部電極2B1の端部幅D1を隣接する点灯部電極1A1の段違い端部の上方に張り出すようにして当該点灯部電極1B1の幅D2より広く形成する。

【0032】このようにして、上記点灯部電極1A1、1A2、…の端子部電極3A1、3A2、…および点灯部電極1B1、1B2、…の配線部電極2B1、2B2、…とを互いに段違いに配置することで配線部電極の幅を広げ、隣接する配線部電極間の間隔を狭めることができる。

【0033】この実施例の構成により、配線部電極パターンからの光漏れが低減されると共に、配線部電極の抵抗値が均一化され、表示むらのない高画質の表示が可能となる。

【0034】図2は本発明による液晶表示素子の他の実施例を説明するための配線部近傍の模式図であって、前記図1と同一符号は同一部分に対応する。

【0035】本実施例は、配線部電極の形状が異なる他は前記実施例と同様である。すなわち、本実施例の配線部2A1、2A2、…および2B1、2B2、…は、点灯部電極1A1、1A2、…および1B1、1B2、…との接続部分で幅D1とし、この部分から端子部電極3A1、3A2、…および3B1、3B2、…に向けて漸次幅が低減する形状に形成されている。

【0036】本発明における配線部電極の形状は、点灯部電極との接続部分の形状を上記各実施例に示したようなもの、または適宜の形状で逆扇形で端子部電極方向に延在するものでよい。

【0037】図3は本発明による液晶表示素子の実施例を説明するための配線部近傍の断面模式図であって、10は一方の基板、20は他方の基板、21は他方の基板に形成した他方の点灯部電極、30は液晶、40はシール剤である。

【0038】液晶表示素子はガラス基板等からなる一対、

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の基板のそれぞれの内面に点灯部電極群1と21を形成し、両基板を貼り合わせて、その間隙に液晶30を注入し、シール剤8で封止してなる。

【0039】点灯部電極1は、点灯領域1Aから配線部領域2Aを介して端子部領域3Aに延在して形成される。そして、上記配線部領域2Aを構成する配線部電極2A1, 2A2, ……および2B1, 2B2, ……(図1、図2参照)とそれぞれの点灯部電極1A1, 1A2, ……および1B1, 1B2, ……の連接部分の端部を前記で説明した形状および電極幅に形成されている。

【0040】なお、配線部電極の少なくとも点灯部電極近傍における相互の間隔を点灯部電極の間隔と略々同等とすることで、点灯部と配線部の境界における光漏れが均等化され表示ムラのさらなる低減効果があると共に、この領域における所謂 $\Delta n \cdot d$ の均一化も達成できる。

【0041】上記の各具体例に説明したように、本発明を適用した液晶表示装置は、その表示領域での明るさの濃淡を低減し、高表示品質の液晶表示素子を得ることができる。

【0042】本発明は上記したSTN型液晶表示素子に限るものではなく、所謂TFT型等のアクティブ・マトリクス型液晶表示素子にも適用できるものであることは言うまでもない。

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【0043】

【発明の効果】以上説明したように、本発明によれば、表示部電極群と端子部電極群の間に介在する配線部電極群の各配線電極の幅を広くすることでバックライトの光漏れが低減されると共に、配線抵抗値が均一化され、高品質の液晶表示素子を提供することができる。

【図面の簡単な説明】

【図1】本発明による液晶表示素子の一実施例を説明するための配線部近傍の模式図である。

【図2】本発明による液晶表示素子の一実施例を説明するための配線部近傍の模式図である。

【図3】本発明による液晶表示素子の実施例を説明するための配線部近傍の断面模式図である。

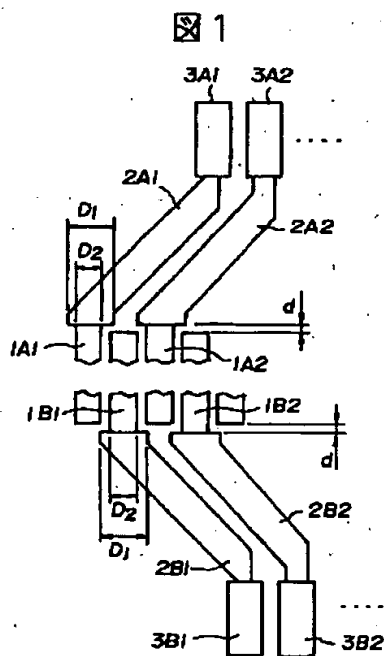
【図4】点灯部電極と配線部電極および端子部電極の配置例を説明する模式図である。

【図5】従来技術における点灯部電極と端子部電極を接続する配線部電極の構成例を説明する模式図である。

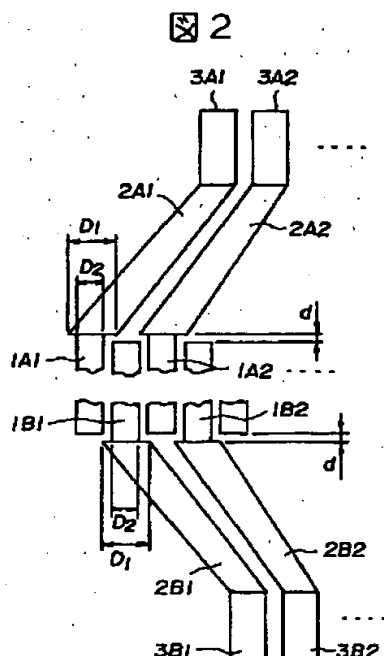
【符号の説明】

1A1, 1A2, …… 1B1, 1B2, …… 点灯部電極
2A1, 2A2, …… 2B1, 2B2, …… 配線部電極
3A1, 3A2, …… 3B1, 3B2, …… 端子部電極
10, 20 基板
30 液晶
40 シール剤。

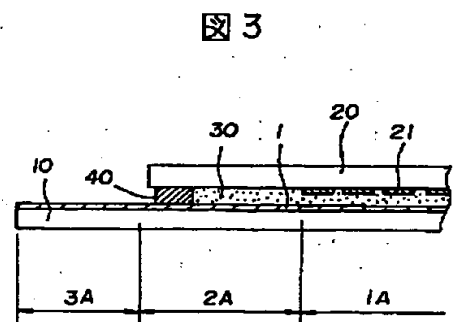
【図1】



【図2】



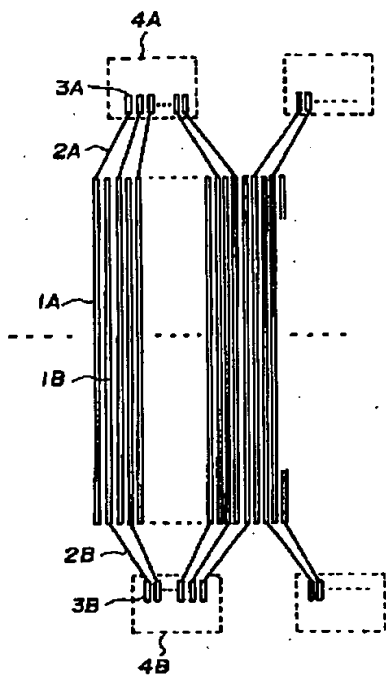
【図3】



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【図4】

図4



【図5】

図5

